

**WHAT IS CLAIMED IS:**

1           1. A reconfigurable chip comprising:  
2           a multiplication block including at least one multiplication unit and a  
3           group of selectable adder units operably connected to the multiplication unit,  
4           wherein the adder units are selectively connectable in different configurations; and  
5           interconnect elements operably connected to the multiplication block, the  
6           interconnect elements adapted to selectively connect together the multiplication  
7           block with other reconfigurable units.

1           2.     The reconfigurable chip of Claim 1 wherein the multiplication  
2           block further comprises input multiplication multiplexers for the block.

1           3.     The reconfigurable chip of Claim 2, wherein there are fewer  
2           block input multiplexers than input multiplexers for the multiplication units.

1           4.     The reconfigurable chip of Claim 1 wherein the adder units  
2           include input multiplexers.

1           5.     The reconfigurable chip of Claim 1 wherein the multiplication  
2           units include input multiplexers.

1           6.     The reconfigurable chip of Claim 1 wherein there are multiple  
2           multiplication units in each block.

1           7.     The reconfigurable chip of Claim 1 wherein the instruction  
2           configures the multiplexers in the multiplication block.

1           8.     The reconfigurable chip of Claim 1 wherein the multiplication  
2 block includes registers associated with the multiplication unit and adder units.

1           9.     The reconfigurable chip of Claim 1 wherein the other type of unit  
2 is operably connectable to the adder units and can be used instead of multiplier  
3 units.

1           10.    The reconfigurable chip of Claim 9 wherein the other type of unit  
2 comprises the despreader/correlator unit.

1           11.    The reconfigurable chip of Claim 1 wherein the adder units can  
2 be connected together into chains.

1           12.    The reconfigurable chip of Claim 1 wherein the interconnect  
2 elements are adapted to transfer word length data.

1           13.    The reconfigurable chip of Claim 1 wherein further comprising an  
2 instruction memory storing multiple instructions for the reconfigurable functional  
3 units.

1           14.    The reconfigurable chip of Claim 13 wherein a state machine  
2 addresses the instruction memory.

1           15.    The reconfigurable chip of Claim 1 wherein the multiplication  
2 block includes a selectable output register for the multiplier units and the adder  
3 units.

1           16.    The reconfigurable chip of Claim 1 wherein the multiplication  
2 block includes at least two multiplication units.

1           17.    The reconfigurable chip of Claim 1 wherein the multiplication  
2 block includes at least four multiplication units.

1           18.    A reconfigurable chip including:  
2           a multiplication block including at least one input multiplexer, a  
3 multiplication unit operably connected to the input multiplexer, a group of  
4 selectable adder units operably connected to the multiplication unit, wherein the  
5 adder units are selectively connectable in different manners; and  
6           an instruction memory storing multiple instructions for the multiplication  
7 block.

1           19.    The reconfigurable chip of Claim 18 wherein there are input  
2 multiplexers for the block.

1           20.    The reconfigurable chip of Claim 18 wherein there are input  
2 multiplexers associated with the adder units.

1           21.    The reconfigurable chip of Claim 18 wherein there are input  
2 multiplexers for the multiplication unit.

1           22.    The reconfigurable chip of Claim 18 wherein there are fewer  
2 block input multiplexers and then input multiplexers for the multiplication units.

1           23.    The reconfigurable chip of Claim 18 wherein there are multiple  
2 multiplication units in each block.

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1           24.    The reconfigurable chip of Claim 23, wherein there are at least  
2   four multiplication units in each multiplication block.

1           25.    The reconfigurable chip of Claim 18 wherein the multiplication  
2   block includes a decoder to decode a portion of the instruction.

1           26.    The reconfigurable chip of Claim of 18 wherein the multiplication  
2   block includes registers associated with the adders units and multiplication units.

1           27.    The reconfigurable chip of Claim 26 wherein the registers of  
2   selectable output registers.

1           28.    The reconfigurable chip of Claim 18 wherein another type of unit  
2   is operably connectable to the adders and can be used instead of the multiplier unit.

1           29.    The reconfigurable chip of Claim 28 wherein the other type of  
2   unit is a despreader/correlator unit.

1           30.    The reconfigurable chip of Claim 18 wherein the adder units can  
2   be connectable into a chains.

1           31.    The reconfigurable chip of Claim 18 further comprising  
2   interconnect units operably connected to the multiplication block.

1           32.    The system of Claim 18 wherein the instruction memory is  
2   addressed by a state machine.

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1           33.    A reconfigurable chip including:  
2                a multiplication block including at least one input multiplexer, a  
3 multiplication unit operably connected to the input multiplexer, a group of  
4 selectable adder units operably connected to the multiplication unit, wherein the  
5 adder units are selectively connectable in different manners; and  
6                an instruction memory storing multiple instructions for the multiplication  
7 block.

1           34.    The multiplication block of Claim 33 wherein there are fewer  
2 block input multiplexers than input multiplexers for the multiplication units.

1           35.    The multiplication block of Claim 33 wherein there are at least  
2 four multiplication units in each multiplication block.

1           36.    The reconfigurable chip of Claim 33, wherein there are four  
2 multiplication units in each multiplication block.

1           37.    The reconfigurable chip of Claim 33 wherein the multiplication  
2 blocks are configured by an instruction.

1           38.    The reconfigurable chip of Claim 37 wherein at least portions of  
2 the instruction is sent to a decoder in the multiplication block.

1           39.    The system of Claim 33 wherein the multiplication block includes  
2 registers in the multiplication block to store output values.

1           40.    The multiplication block of Claim 39 wherein the registers are  
2 selectable output registers.

multiple block input multiplexers;  
at least two multiplication units, each multiplication unit associated with  
two multiplication input multiplexers, the multiplication input multiplexers  
operably connected to the multiple block input multiplexers; and

7                   a group of selectable adder units with associated adder input  
8   multiplexers, the adder input multiplexers operably connected to the multiplication  
9   units.

1                    48.     A reconfigurable chip comprising:  
2                    a multiplication block including at least one multiplication unit and a  
3                    group of selectable adder units operably connected to the multiplication unit,  
4                    wherein the adder units are selectively connectable in different configurations; and  
5                    reconfigurable functional units operably connectable to the multiplication  
6                    block, the reconfigurable functional units including an arithmetic logic unit and a  
7                    shifter unit units.